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10/776,295	02/11/2004	Vladimir Z. Mesarovic	1438-CA	3514

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EXAMINER	
ELBIN, JESSE A	

ART UNIT	PAPER NUMBER
2615	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/776,295	MESAROVIC ET AL.	
	Examiner	Art Unit	
	JESSE A. ELBIN	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 February 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

a. Reference number 114 in Fig. 1A

b. Reference number 113 and 114 in Fig. 1B

2. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

a. Paragraph 4 of the specification refers to "post processing software architecture 11 of digital A/V system…" where reference number 11 is not included in the drawing.

4. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The disclosure is objected to because of the following informalities:

a. Reference numbers 113 and 114 are not described in the specification.

b. Reference number 11 in paragraph 4 has not been illustrated in the drawings.

Appropriate correction is required.

Claim Objections

6. Claims 7, 17, 20, 22, 28, and 31 are objected to because of the following informalities:

a. Claims 7, 17, and 31 are written as a Markush group drawn to the genus: audio compression formats. Within that Markush group is 'portable networks graphics (PNG)'. Currently, PNG is not used as an audio compression format. Therefore the Markush group is improperly claimed. For the purposes of the art rejection below, the group will be read in the alternative, selecting from the available members of the genus.

b. Claims 7, 17, and 31 also include trademarks in the limitations. Use of trademarks is not allowed as the bounds of a trademark's meaning may change over time. Currently AC3, WMA, WAV, DTS, PCM, and DTS-ES audio coding standards come in multiple variants or revisions. While HDCD, MP3, AAC, Dolby Digital-EX, DTS-96/24, WMA-Pro, MP3-Pro, and MLP are more descriptive of a specific audio coding standard, their meaning can still change over time.

c. Claim 20 is written as dependent upon claim 18, however claim 18 does not include a data buffer to provide antecedent basis for the phrase 'the data buffer'. For the purposes of the art rejection below, claim 20 will be interpreted as being dependent upon claim 19.

d. Claim 22 includes an incomplete sentence. The last limitation in the claim is written as "means for performing the common operation using the requested", which appears to be lacking a sentence predicate. For the purposes of the art rejection below, the limitation will be interpreted as "means for performing the common operation using the requested CPM."

e. Claim 28 is dependent upon claim 27 and includes the phrase 'the computer readable medium'. Claim 27 does not include a computer readable medium; therefore claim 28 lacks proper antecedent basis. For the purposes of the art rejection below, claim 27 will be interpreted as: "A computer program product including a computer readable medium having code encoded therein…"

Appropriate correction is required.

Claim Interpretation

7. Claim 22 is written in "means for" language, but fails to invoke 35 U.S.C. 112, sixth paragraph. The specification does not list specific structure for performing the specified tasks. For the purposes of the art rejection below, the claim will be given its broadest reasonable interpretation.

Claim Rejections - 35 USC § 101

8. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. Claims 1, 28-31 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 28 suggests the computer readable medium including a 'network, wireline, wireless or other communications medium'. This language suggests that all computer or processor readable medium could include non-

statutory subject matter. Therefore all claims drawn to a computer or processor readable medium without further limiting the scope of the phrase, are non-statutory.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 1, 5-18, 21-23, 26-28, and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita et al. (Audio Processing on AV Decoder LSI for DVD-Audio, August 2000) henceforth referred to as 'Fujita' in view of Wheeler et al. (Advanced DSP Supports Home Theater and Surround-Sound Audio) henceforth referred to as 'Wheeler'.

Regarding claims 1, 5 and 6, Fujita teaches an audio-video signal processing system (Fujita, Title) having a partitioned software architecture (Fujita, Fig. 2), the system comprising: a processor (Fujita, §3.1 line 1); and a ROM (processor readable medium coupled to the processor; Fujita, §3.1, lines 15-18), the ROM having built in instructions for realizing various functions (signal processing code; Fujita, §3.1 lines 15-16) to process an input signal (*signal input via the IOP unit*; Fujita, §3.2 lines 10-12), the signal processing software (code) comprising: audio threads (application specific code; Fujita, §3.2 lines 1-3) comprising a plurality of audio decoding blocks (application specific modules; Fujita, Fig. 2), wherein each decoding block includes software to cause the processor to decode the audio (perform at least one application specific operation; Fujita §3.1 lines 1-2); and a common control block (common processing code; Fujita, Fig. 2).

Fujita does not teach the common processing code comprising a plurality of common processing modules, wherein each common processing module includes code to cause the processor to perform at least one common processing operation and each common processing module is compatible with a plurality of application specific modules.

In the same field of endeavor, Wheeler teaches a post-decoder block and a post-processing block (common processing code; Wheeler Fig. 2) comprising a plurality of common processing modules (Wheeler, illustrated within the post-decoding and post-processing blocks of Fig. 2), wherein each common processing module includes code to

cause the processor to perform at least one common processing operation and the processor must support myriad combinations (each common processing module is compatible with a plurality of application specific modules; Wheeler page 2, col. 1 lines 25-26) for the benefit of providing a system that supports various input sources while maintaining a set list of output options.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the processor software as taught by Fujita with the specific common processing modules as taught by Wheeler for the benefit of supporting various input sources while maintaining a set list of output options.

Regarding claim 7, Fujita and Wheeler remain as applied above.

Fujita further teaches the audio compression formats include: Dolby Digital, MPEG audio (AC3), LPCM (PCM), DTS (DTS), and DVD-Audio (MLP).

Wheeler further teaches the audio compression formats include: DTS 5.1, DTS 6.1 (DTS-ES), DTS 96/24, AAC, and MPEG-BC.

Regarding claim 8, Fujita and Wheeler remain as applied above.

Wheeler further teaches each common processing module performs an operation including: bass (bass management), dynamic EQ (tone control/equalization), original surround, Dolby ProLogic (matrix decoding), and Dolby Virtual Speaker (virtualization).

Regarding claims 9 and 10, Fujita and Wheeler remain as applied above.

Wheeler does not explicitly teach requesting a single CPM to run; however Wheeler teaches at least 7 post-decoding algorithms, which are not all compatible output formats (loading into system memory only one matrix decoder or virtualizer for on-demand processing; Wheeler Fig. 2) making it obvious to choose a single algorithm to run.

It would have been obvious to one of ordinary skill in the art at the time of the invention to require only one output algorithm to run for a single output, as it would be wasteful of processing power to prepare more data streams than can be output.

Regarding claim 11, Fujita and Wheeler remain as applied above.

Fujita further teaches a system for use as a DVD video player (digital video disc processing system; Fujita §1).

Regarding claims 12, 15, and 16, Fujita teaches audio processing (method of processing data using, Fujita Title) with a processor (Fujita, §3.1 line 1) and software (Fujita, §3.2) architecture partitioned between digital audio decoding blocks (application specific modules, (ASMs); Fujita, Fig. 2) and a common control block (common processing module (CPMs); Fujita, Fig. 2), the method comprising: receiving input data (*signal input via the IOP unit*; Fujita §3.2 lines 10-12);

Fujita does not explicitly teach a plurality of common processing modules, requesting one of the ASMs to perform an application specific operation on the input data; performing the application specific operation using the requested ASM; requesting

one of the CPMs to perform a common processing operation, wherein each of the CPMs is compatible with a plurality of the ASMs; and performing the common processing operation using the requested CPM.

In the same field of endeavor, Wheeler teaches a post-decoder block and a post-processing block including a plurality of algorithms (common processing modules (CPMs); Wheeler, page 2, col. 1, lines 23-25), invoking the correct decoding software (requesting one of the ASMs to perform an application specific operation on the input data; Wheeler, page 2, col. 1, line 28), running the decoders (performing the application specific operation using the requested ASM; Wheeler page 2, col. 1, line 10); requesting one of the CPMs to perform a common processing operation (*Wheeler does not explicitly teach requesting a single CPM to run; however Wheeler teaches at least 7 post-decoding algorithms, which are not all compatible output formats, making it obvious to choose a single algorithm to run*; Wheeler Fig. 2), wherein the processor must support myriad combinations (each CPMs is compatible with a plurality of ASMs; Wheeler page 2, col. 1 lines 25-26); and performing additional functions (the common processing operation using the requested CPM; Wheeler page 2, col. 1, lines 12-15) for the benefit of providing a system that supports various input sources while maintaining a set list of output options.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the processor software as taught by Fujita with the specific common processing modules as taught by Wheeler for the benefit of supporting various input sources while maintaining a set list of output options.

Regarding claims 13 and 14, Fujita and Wheeler remain as applied above.

Wheeler does not explicitly teach requesting a single CPM to run; however Wheeler teaches at least 7 post-decoding algorithms, which are not all compatible output formats (loading into system memory only one matrix decoder or virtualizer for on-demand processing; Wheeler Fig. 2), making it obvious to choose a single algorithm to run.

It would have been obvious to one of ordinary skill in the art at the time of the invention to require only one output algorithm to run for a single output, as it would be wasteful of processing power to prepare more data streams than can be output.

Regarding claim 17, Fujita and Wheeler remain as applied above.

Fujita further teaches the audio compression formats include: Dolby Digital, MPEG audio (AC3), LPCM (PCM), DTS (DTS), and DVD-Audio (MLP).

Wheeler further teaches the audio compression formats include: DTS 5.1, DTS 6.1 (DTS-ES), DTS 96/24, AAC, and MPEG-BC.

Regarding claim 18, Fujita and Wheeler remain as applied above.

Wheeler further teaches each common processing module performs an operation including: bass (bass management), dynamic EQ (tone control/equalization), original surround, Dolby ProLogic (matrix decoding), and Dolby Virtual Speaker (virtualization).

Regarding claim 21, Fujita and Wheeler remain as applied above.

Fujita further teach a system for use as a DVD video player (digital versatile disc processing system; Fujita §1) which inherently supplied digital audio data.

Regarding claim 22, Fujita teaches an audio-video signal processing system (Fujita, Title) having a software architecture (Fujita, Fig. 2) partitioned between audio decoding blocks (application specific modules, (ASMs); Fujita, Fig. 2) and a common control block (common processing module (CPMs); Fujita, Fig. 2), the system comprising: means for receiving input data (*signal input via the IOP unit*; Fujita §3.2 lines 10-12);

Fujita does not explicitly teach a plurality of common processing modules, means for requesting one of the ASMs to perform an application specific operation on the input data; means for performing the application specific operation using the requested ASM; means for requesting one of the CPMs to perform a common processing operation, wherein each of the CPMs is compatible with a plurality of the ASMs; and means for performing the common processing operation using the requested CPM.

In the same field of endeavor, Wheeler teaches a post-decoder block and a post-processing block including a plurality of algorithms (common processing modules (CPMs); Wheeler, page 2, col. 1, lines 23-25), the processor invoking the correct decoding software (means for requesting one of the ASMs to perform an application specific operation on the input data; Wheeler, page 2, col. 1, line 28), the processor running the decoders (means for performing the application specific operation using the

requested ASM; Wheeler page 2, col. 1, line 10); the processor requesting one of the CPMs to perform a common processing operation (*Wheeler does not explicitly teach requesting a single CPM to run; however Wheeler teaches at least 7 post-decoding algorithms, which are not all compatible output formats, making it obvious to choose a single algorithm to run*; Wheeler Fig. 2), wherein the processor must support myriad combinations (each CPM is compatible with a plurality of ASMs; Wheeler page 2, col. 1 lines 25-26); and the processor performing additional functions (means for the common processing operation using the requested CPM; Wheeler page 2, col. 1, lines 12-15) for the benefit of providing a system that supports various input sources while maintaining a set list of output options.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the processor software as taught by Fujita with the specific common processing modules as taught by Wheeler for the benefit of supporting various input sources while maintaining a set list of output options.

Regarding claim 23, Fujita teaches a method of developing a segmented software architecture for an audio/video system (Fujita, Abstract), the method comprising: audio decoding blocks (application specific code; Fujita, Fig. 2) and a common control block (common processing code; Fujita, Fig. 2) to cause a core processor (one or more audio/video processors of the audio/video system; Fujita, §3.1 line 1) to decode audio and video (perform predetermined operations; Fujita, §3.1 lines 1-2), wherein partitioning the software comprises: generating a plurality of audio

decoding blocks (application specific modules; Fujita, Fig. 2), wherein each audio decoding block decodes specific audio formats (consolidates unique code used for at least one of the processor operations; Fujita, §3.2 lines 6-10); and generating a common control block (common processing module; Fujita §3.2 line 6).

Fujita does not explicitly teach a plurality of common processing modules that are compatible with a plurality of application specific modules for performing operations in conjunction with a plurality of application specific modules.

In the same field of endeavor, Wheeler teaches a post-decoder block and a post-processing block including a plurality of algorithms (common processing modules (CPMs); Wheeler, page 2, col. 1, lines 23-25), wherein the processor must support myriad combinations (each CPM is compatible with a plurality of ASMs; Wheeler page 2, col. 1 lines 25-26) for post performing post-decoding and post-processing operations on the decoded audio signal (performing operations in conjunction with a plurality of application specific modules; Wheeler page 2, col. 1 lines 21-28) for the benefit of providing a system that supports various input sources while maintaining a set list of output options.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the development of processor software as taught by Fujita with the specific common processing modules as taught by Wheeler for the benefit of supporting various input sources while maintaining a set list of output options.

Regarding claim 26, Fujita and Wheeler remain as applied above.

Wheeler further teaches the pre-decoder block (application specific modules; Wheeler Fig. 2) including audio decoders, and the post-decoder block and post-processing block (common processing code; Wheeler Fig. 2) comprising audio post-processing code).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the pre-decoder block, and post-decoder and post-processing blocks as taught by Wheeler as audio decoders and post-processing code in the AV decoder system as taught by Fujita and Wheeler.

Regarding claims 27-28, and 30, Fujita teaches an audio processing LSI (computer program product; Fujita Title) having SDRAM and ROM (a computer readable medium; Fujita §3.1 lines 12-16) and having software (code encoded therein; Fujita §3.2) to direct a processor (Fujita §3.1 line 1) to process a signal, the software (code) comprising: an audio thread (application specific code; Fujita §3.2 line 6) comprising a plurality of audio decoding blocks (application specific modules; Fujita §3.2 lines 6-10), wherein each decoding block includes software to cause the processor to decode the audio (perform at least one application specific operation; Fujita §3.1 lines 1-2); and a common control block (common processing code; Fujita, Fig. 2).

Fujita does not teach the common processing code comprising a plurality of common processing modules, wherein each common processing module includes code to cause the processor to perform at least one common processing operation and each

common processing module is compatible with a plurality of application specific modules.

In the same field of endeavor, Wheeler teaches a post-decoder block and a post-processing block (common processing code; Wheeler Fig. 2) comprising a plurality of common processing modules (Wheeler, illustrated within the post-processing block of Fig. 2), wherein each common processing module includes code to cause the processor to perform at least one common processing operation and the processor must support myriad combinations (each common processing module is compatible with a plurality of application specific modules; Wheeler page 2, col. 1 lines 25-26) for the benefit of providing a system that supports various input sources while maintaining a set list of output options.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the processor software as taught by Fujita with the specific common processing modules as taught by Wheeler for the benefit of supporting various input sources while maintaining a set list of output options.

Regarding claim 31, Fujita and Wheeler remain as applied above.

Fujita further teaches the audio compression formats include: Dolby Digital, MPEG audio (AC3), LPCM (PCM), DTS (DTS), and DVD-Audio (MLP).

Wheeler further teaches the audio compression formats include: DTS 5.1, DTS 6.1 (DTS-ES), DTS 96/24, AAC, and MPEG-BC.

13. Claims 2-4 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita et al. (Audio Processing on AV Decoder LSI for DVD-Audio, August 2000) henceforth referred to as 'Fujita' in view of Wheeler et al. (Advanced DSP Supports Home Theater and Surround-Sound Audio) henceforth referred to as 'Wheeler' as applied to claims 1 and 23 above, further in view of Divine et al. (US Patent 6,081,783 ('783)), and further in view of Yamaguchi et al. (A Single Chip AV Decoder for the DVD Player Adopting the MCP Architecture, 1998) henceforth referred to as Yamaguchi.

Regarding claim 2, Fujita and Wheeler remain as applied above.

Fujita further teaches the processor is a digital signal processor (Fujita Fig. 2) and the ROM (processor readable medium) is system memory.

Neither Fujita, nor Wheeler teach application specific module (ASM) managers stored in the system memory wherein each ASM manager includes data fields specifying attributes and operational codes; and common processing module (CPM) managers stored in the system memory wherein each CPM manager includes data fields specifying attributes and operational codes; and a second processor for processing input data received by the system and having write access to the ASM and CPM managers to correlate information contained by the data fields of the ASM and CPM managers with information; wherein the digital signal processor has read access to the ASM and CPM managers and can detect changes to the ASM and CPM managers.

In the same field of endeavor, Divine teaches audio input and decoding managers (application specific module (ASM) managers; '783 Tables 64, 65) stored in the system memory wherein each manager includes data fields specifying attributes and operational codes ('783 Tables 64, 65); output processing managers (common processing module (CPM) managers stored in the system memory; '783 col. 103 lines 20-35 and Table 67) wherein each manager includes data fields specifying attributes and operational codes ('783 col. 103 lines 20-35 and Table 67); and providing a write command to the manager (having write access to the managers to correlate information contained by the data fields of the managers with information; '783 col. 6 lines 16-17); and read manager and read manager response commands (the digital signal processor has read access to the managers and can detect changes to the managers; '783 col. 6 lines 19-22) for the benefit of providing a processing system with a higher throughput speed.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the audio decoding system as taught by Fujita and Wheeler with the data structures of Divine for the benefit of increasing processor throughput.

In the same field of endeavor, Yamaguchi teaches an I/O processor core (second processor; Yamaguchi §C.1) for processing input data received by the system (Yamaguchi Fig. 2) for the benefit of allowing the DSP processing power to focus on decoding.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the audio decoding system as taught by Fujita and Wheeler with the

co-processor architecture of Yamaguchi for the benefit of allowing the DSP processing power to focus on decoding.

Regarding claim 3, Fujita, Wheeler, Divine, and Yamaguchi remain as applied above.

Yamaguchi further teaches the second processor is a RISC processor (Yamaguchi §C.1 line 1) for the benefit of providing limited control of the system independent of the main processor.

Regarding claim 4, Fujita, Wheeler, Divine, and Yamaguchi remain as applied above.

Divine further teaches shared data RAM ('783 #204) which allows both DSPs to share data and processing coefficients (a copy of the ASM and CPM managers locally accessible to the digital signal processor to prevent read/write data conflicts; '783 Fig. 2) for the benefit of maintaining continuity between all components of the system.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the audio manger as taught by Divine, included in the audio decoding system as taught by Fujita, Wheeler, Divine, and Yamaguchi, by sharing the data managers using shared memory as taught by Divine for the benefit of maintaining continuity between all components of the system.

Regarding claim 24, Fujita and Wheeler remain as applied above.

Fujita further teaches the one or more audio processors comprise a digital signal processor (Fujita Fig. 2)

The combination fails to explicitly teach a communication processor responsible for communications between the digital signal processor and peripheral components of the audio/visual system, the method further comprising: associating a manager with each application specific module and each common processing module to store data accessible to the digital signal processor and the communication processor.

In the same field of endeavor, Yamaguchi teaches an I/O processing part including an IOP Core (communications processor; Yamaguchi Fig. 2) responsible for communications between the digital signal processor and peripheral components of the audio/visual system (Yamaguchi §C lines 1-2) for the benefit of splitting processing tasks, allowing the decoder to focus on decoding audio/video signals.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the separate IO processor's ability to control the peripheral components of the system as taught by Yamaguchi with the AV decoding system as taught by the combination of Fujita and Wheeler.

Neither Fujita, Wheeler, nor Yamaguchi teach associating a manager with each application specific module and each common processing module to store data accessible to the digital signal processor and the communication processor.

In the same field of endeavor, Divine teaches multiple managers associated with separate audio decoding (application specific module; '783 Table 64) and outputting functions (common processing module; '783 Table 67 and col. 106 lines 20-35) to send

to the digital signal processor (to store data accessible to the digital signal processor and the communication processor; col. 100 lines 44-47) for the benefit of ensuring all of the proper settings in the system are selected.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the audio managers as taught by Divine with the multiprocessor AV decoding system as taught by the combination of Fujita, Wheeler, and Yamaguchi for the benefit of ensuring all of the proper settings in the system are selected.

Regarding claim 25, Fujita, Wheeler, Yamaguchi, and Devine remain as applied above.

Devine further teaches the audio managers are ready by the DSP while the system is running (a copy of the managers local to the digital signal processor during operation of the audio/video system; '783 col. 100 lines 44-47).

1. Claims 19-20 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita et al. (Audio Processing on AV Decoder LSI for DVD-Audio, August 2000) henceforth referred to as 'Fujita' in view of Wheeler et al. (Advanced DSP Supports Home Theater and Surround-Sound Audio) henceforth referred to as 'Wheeler' as applied to claims 12 and 27 above, and further in view of Devine et al. (US Patent 6,081,783 ('783)).

Regarding claim 19, Fujita and Wheeler remain as applied above.

The combination fails to teach requesting one of the ASMs to perform an operation on the input data comprises: writing a command word in a data buffer specifying parameters of the request; reading the command word in the data buffer with a digital signal processor; and updating a manager associated with the requested ASM with at least a subset of the parameters.

In the same field of endeavor, Divine teaches writing a command using the Write AC3 command to adjust the audio decoding properties (writing a command word; '783 col. 6 lines 23-24) which is read by a digital signal processor ('783 200a or 200b); and using the audio manager indices (updating a manager associated with the requested ASM; '783 Table 64) to update at least a subset of the parameters for the benefit of ensuring all of the proper decoding and output settings are selected in the system.

It would have been obvious to one of ordinary skill in the art at the time of the invention to write a command to a DSP to adjust the parameters of the decoding or output to ensure all of the proper settings are selected in the system.

Neither Divine, Fujita, nor Wheeler explicitly teach using a data buffer for the commands used; however Divine does teach using a buffer for the data input, which would have suggested to one of ordinary skill in the art to also use a buffer for the data commands as was common practice at the time of the invention.

Regarding claim 20, Fujita, Wheeler, and Divine remain as applied above.

Neither Fujita, Wheeler, nor Divine explicitly teach using a FIFO buffer with sufficient size to allow reading processes and writing processes to perform at respective paces.

It was well known and therefore would have been obvious to one of ordinary skill in the art at the time of the invention to use a FIFO buffer sized according to the demands of the system to prevent a buffer overrun condition, and ensuring all commands are executed successfully.

Regarding claim 29, Fujita and Wheeler remain as applied above.

The combination does not teach a manager associated with each application specific module and each common processing module to store data accessible to the digital signal processor and the communication processor.

In the same field of endeavor, Divine teaches multiple managers associated with separate audio decoding (application specific module; '783 Table 64) and outputting functions (common processing module; '783 Table 67 and col. 106 lines 20-35) to send to the digital signal processor (to store data accessible to the digital signal processor and the communication processor; col. 100 lines 44-47) for the benefit of ensuring all of the proper settings in the system are selected.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the audio managers as taught by Divine with the multiprocessor AV decoding system as taught by the combination of Fujita, Wheeler, and Yamaguchi for the benefit of ensuring all of the proper settings in the system are selected.

Conclusion

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Laczko et al. (US Patent 5,644,310) teaches an audio decoder system with separate decoder block and output blocks, all connected to a single control register.

b. Endoh et al. (US Patent 5,896,358) teaches an audio system which has separated audio decoder and mixing sections and automatically adjusting settings based on a sensed mode.

c. Huang et al. (US Patent 6,119,091) teaches a DVD audio decoder having multiple decoding blocks and separate output interface.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSE A. ELBIN whose telephone number is (571)270-3710. The examiner can normally be reached on Monday through Friday, 8:00am to 5:00pm EDT.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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